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# Pontoon Bridging in Winter

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At the military scientific conference held at the 46th Pontoon Bridging Regiment, theoretical and practical problems concerning the construction of bridge crossings in winter were discussed together with the most efficient methods of solving them. A number of suggestions made by the officers were later tested by special tactical training and exercises at company, battalion, and regimental level. As a result certain drills and methods were worked out which made it possible for a regiment to construct bridges over ice-covered rivers at the rate of 80 linear meters an hour. On the basis of experience and research certain conclusions can be drawn.

It is advisable to conduct the engineer reconnaissance of the location of the bridge to be built with an engineer reconnaissance group consisting of a platoon of two MAV's and a GAZ-63. The group should be issued radio sets and the relevant equipment for reconnaissance of the river and marking the chosen site.

The regimental commander should have two more engineer reconnaissance groups in reserve, each consisting of two pontoon sections on a GAZ-63 vehicle. They reconnoiter the access routes to the river in the zone selected for the forcing and also the assembly areas for the pontoon-carrying vehicles to move to after unloading the sections.

If the river is forced precipitately, the engineer reconnaissance groups are sent out together with the combined-arms reconnaissance subunits of the units and large units into the zone where the crossing is to be organized by the regiment. The structure of the engineer reconnaissance group for reconnaissance of the movement routes of the pontoon regiment is shown in Figure 1.

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The engineer reconnaissance group maintains communication by radio with the regimental commander and with the commanding officer of the traffic control detachment. The RBM radio set is used as a reserve in the regimental chief of staff's radio net in cases where the engineer reconnaissance group is a long distance away.

On reaching the river it is advisable to organize the operations of the engineer reconnaissance groups as shown in Figure 2 .

With the reconnaissance information in his possession (the width and depth of the river, thickness of ice, profile of the river bottom, the direction of the movement routes to the river of the pontoon-carrying vehicles, and assembly areas for empty pontoon-carrying vehicles), the officer in charge of the reconnaissance meets the regimental commander at an appointed place and reports the results of the reconnaissance.

According to the decision reached, snow is cleared from the ice to a width of 1.0 m (on the axis of the selected bridge crossing), the approach routes to the river for the pontoon-carrying vehicles, the places for unloading of the pontoon sections, and the exit routes for the empty vehicles to their assembly areas are marked out, a groove is cut in the ice along the axis of the bridge which is marked with paint (ink), and the battalion and company sectors are marked out and assigned.

Snow in the building zone of the bridge is cleared away only in cases where the snow cover reaches more than 10 to 15 cm. The width of the zone to be cleared in the alignment of the bridge is 18 to 20 m, and for the transporting of sections--8 m. This is done manually using wooden spades and scrapers. It is not always possible to employ standard snow-clearing equipment directly on the river, as the ice may not support a vehicle of 8 to 10 tons. The approach routes to the river are cleared of snow by the standard snow-clearing means.

Snow clearance requires the expenditure of much labor and time, and it is therefore necessary to do this work before the move of the pontoon park to the river. We have employed the following method. From each of the pontoon companies, a platoon was detailed on a GAZ-63 vehicle with the necessary instruments. The platoons under the command of the deputy regimental commander moved to the river after the reconnaissance and, under cover of the forward subunits which had forced the river across the ice, began clearing the snow.

The unloading of the pontoon sections onto the ice should be done with the aid of the vehicle winches and using the standard loading beams and wooden poles (slega). In areas where steep banks exist, it is necessary to make snow cushions to protect the pontoons from damage when unloading onto the ice.

The pontoon sections, after being unloaded from the vehicles can be moved into line with the bridge in two ways: with the aid of block and tackle if the thickness of the ice is less than 30 cm and with GAZ-63 vehicles or BAV if the ice is more than 30 cm. In our case, the sections were put in position by motor vehicles. The floating part of the bridge was assembled by four companies, each one of which had an allotted sector. At the beginning of the assembly, places for the half-rafts (poluparom) were staked out on the ice; at right angles to the axis of the bridge, grooves were made for the places where the half-rafts joined. Every battalion commander received an extract from the regimental bridge-assembly plan with a diagram of the sector and an explanation of the layout of the bridge treads on the rafts. A diagram of the organization of work for bridge building is shown in Figure 3 .

To close the pontoons together, jacks were used, and for joining the treads and tightening the half-rafts, standard hand tackles were employed.

The floating part of the bridge was joined with a special half-raft, the pontoon sections of which were brought up to the assembly point before the work of the battalion sectors was completed. The treads for this center-linking half-raft were obtained from the park of heavy pontoons. Additional oval holes were made in these to facilitate the joining of the floating part (Figure 4). Before moving up into line with the bridge, the treads and the deck panels of the center-linking half-raft were removed. The strength of the joint is not reduced by this method because the span involved is not great.

The method of building a pontoon bridge on ice by organizing the work in four company sectors and using a center-linking half-raft has a number of advantages to [about 6 words missing] first of all the prescribed organization of the subunits of the pontoon companies is not disrupted, the scope of the work increases by approximately one and a half times, thus raising considerably the rates of construction.

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of the floating part of the bridge. Thus, in a special tactical exercise with a regiment, a floating bridge 236 m long with a capacity of 50 tons was constructed over the Nemen River in 4½ hours. In troop exercises, the regiment built a bridge 192 m long with a capacity of 50 tons in 4 hours. In both cases the construction was done precipitately.

In our method, a bridge assembled on the ice was lowered into the water in two ways: by blasting the ice or by breaking it up mechanically. Experience has shown that the mechanical method of sawing up the ice manually or with electric saws requires a great deal of labor and is not very productive. The more efficient way (especially on rivers with fast currents so that the broken ice is carried away by the water) is to employ blasting. It is necessary for this purpose to hack out grooves to a depth of two-thirds of the thickness of the ice along the bank ends of the bridge and lay in them lengths of primacord. The primacord must have: 4 strands for ice up to 20 cm thickness; 6 strands for 30 cm; and if the ice is thicker than 30 cm (up to 50 cm)--8 strands. Under the middle part of the bridge, the ice must be destroyed with explosive charges lowered through holes to the right and left of the axis of the bridge (Figure 5). The size of these charges, the depth of immersion, and the distance between them will depend on the thickness and nature of the ice. These data must be determined by trial blasts.

When the ice was 30 to 50 cm in thickness we used: 1.5 kg of amatol and 20 grams of TNT. The distance between the charges was 6 m. The depth of immersion was 2 m. The holes were manually prepared.

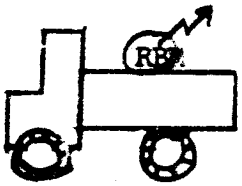
Dismantling a floating bridge and loading onto motor vehicles the pontoon sections of a park under winter conditions require much time, and consequently considerably lower the mobility of the pontoon parks when forcing a number of rivers in succession during a battle.

Practice has shown that dismantling a bridge under winter conditions and loading the pontoon sections onto motor vehicles require twice as much time as assembling it. We carried out this work with teams made up from the companies. The general layout of the organization of this work and the complement of the teams are shown in Figure 6 .

The total time taken for a pontoon regiment to dismantle a bridge with a length of 200 to 240 linear meters and to load the pontoon equipment onto the vehicles was approximately 8 hours.

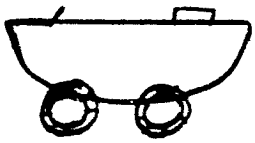
[redacted]

GAZ-63
(a) Subgroup No. 1



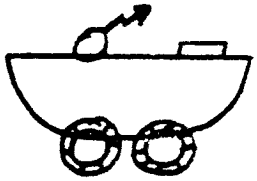
Reconnaissance platoon leader. 1st Reconnaissance Section--7 men ([one word not clear] reconnaissance and clearance of crossing point, set of markers, spades, axes, saw, indicator, PKhR gas detecting instrument, field glasses).

MAV
(b) Subgroup No. 2



Commanding officer of the 2nd Reconnaissance Section. Reconnaissance group--3 men. (Measuring cable, hydroepidometer, surveyor's pole, tape measure, level, DSP-30 range-finder, ice gauge, stakes, 6 flags, PDF long-range camera, PKR [expansion unknown]).

MAV
(c) Subgroup No. 3



Deputy Chief of Staff of the Pontoon Bridging Regiment. Reconnaissance group--3 men. (DSP-30 range-finder, surveyor's pole, level, tape measure, ice gauge, stakes, 6 flags, PBU [expansion unknown]).

FIGURE 1

Structure of an Engineer Reconnaissance Group

of a Pontoon Regiment



[redacted]

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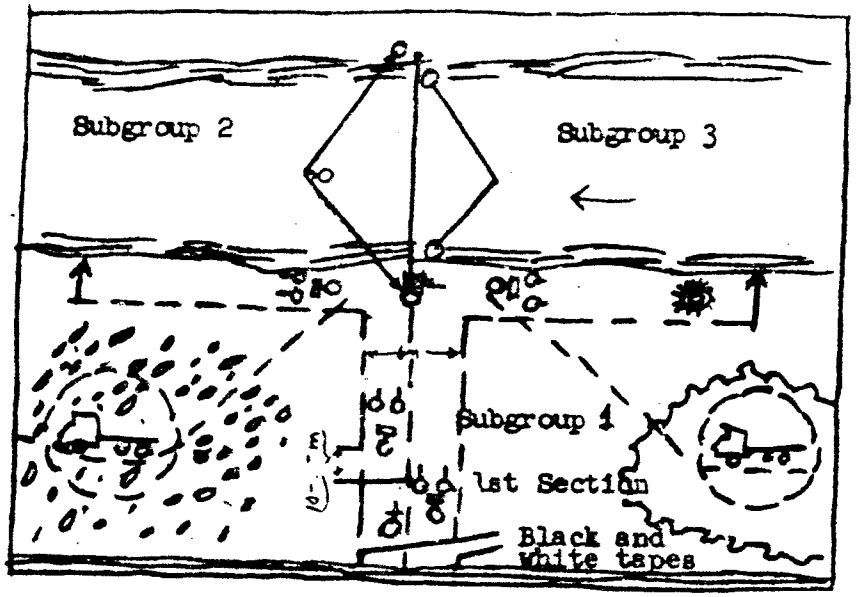


FIGURE 2

Diagram of the Operations of an Engineer Reconnaissance Group

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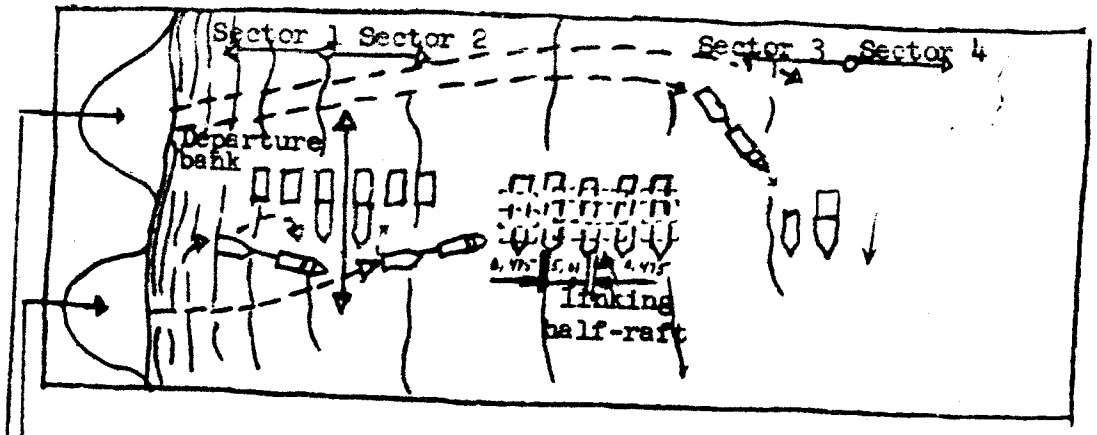


Unloading place for trucks with 2nd pontoon bridge section.

Unloading place for trucks with 1st pontoon bridge section.

FIGURE 3

Bridge-Building Sectors

No. 1 Unloading the pontoon sections--1 officer, 1 NCO, 3 privates;

No. 2 Transporting the sections to the assembly points--1 NCO, 5 privates;

No. 3 Placing the sections in line with the bridge, placing and fastening the treads--3 sections under an officer;

No. 4 Closing up the pontoons, joining half-rafts--2 sections under an officer;

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No. 5 Laying the decking, curbs and railings--1 NCO, 4 privates.

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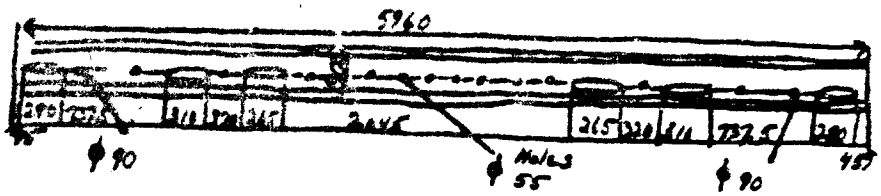


FIGURE 4

TMP Bridge Tread with Oval Holes

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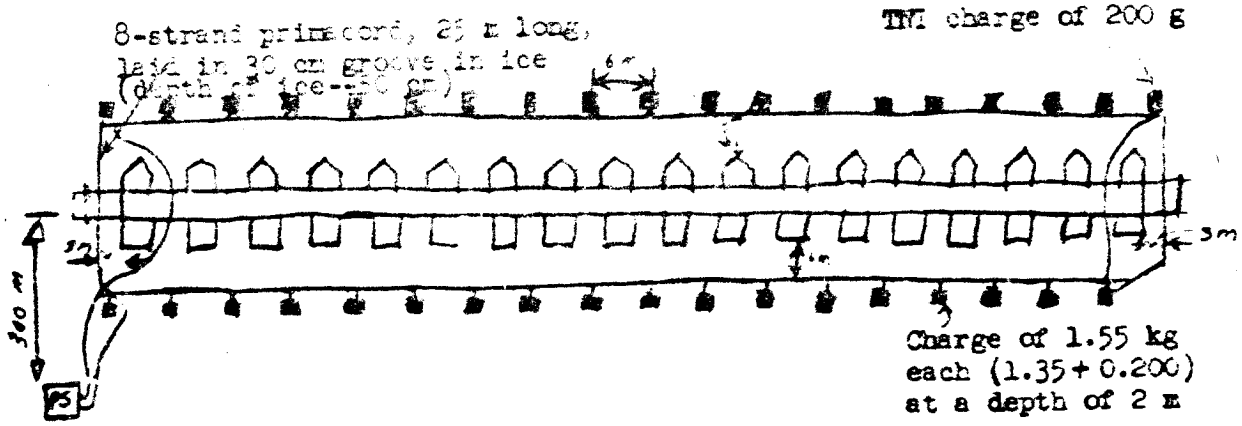



Diagram of Suspension of Charges

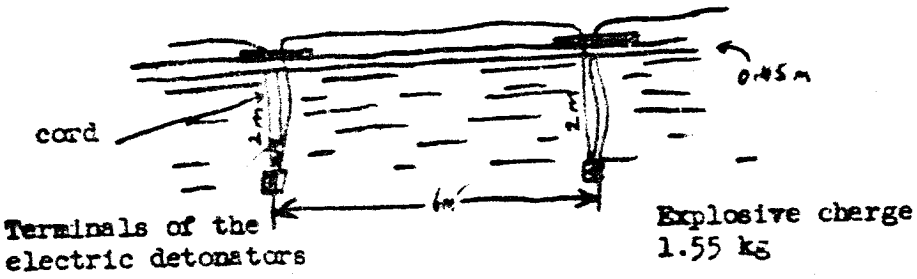
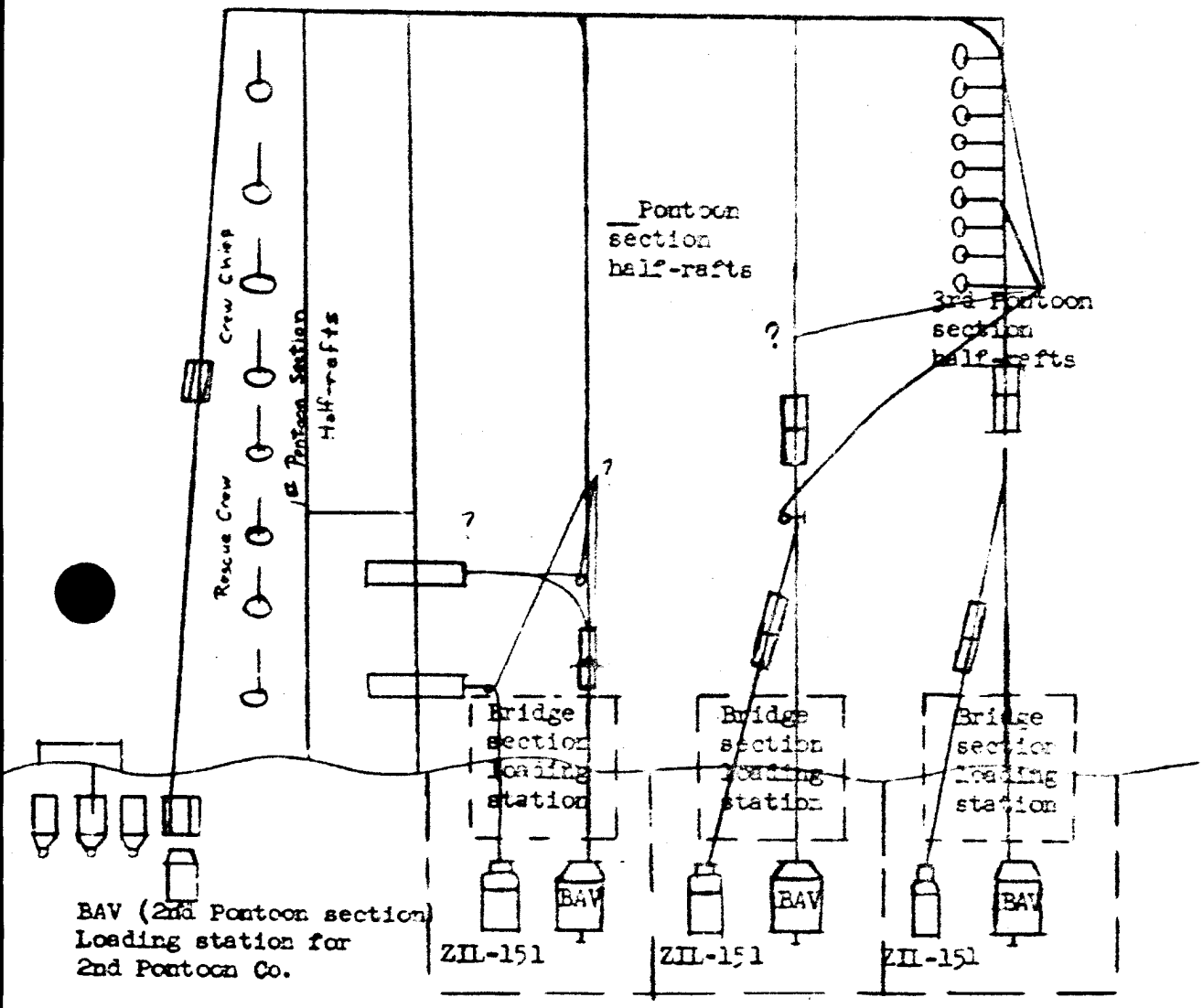



FIGURE 5

Diagram of Placing Charges for Blasting Ice




1st Pontoon Co.--3rd Pontoon Co.--4th Pontoon Co.
Loading Stations

**FIGURE 6**

**Diagram of the Organization of the Dismantling of a Pontoon Bridge and Loading the Pontoon Equipment onto Vehicles**

Composition of the Teams in Company Sectors and the Work They Perform

1. Seven-man team headed by a pontoon platoon leader. Unseals the joints and disconnects the half-rafts. At the conclusion of this work it loads the pontoon sections onto the vehicles.

2. Seven-man team headed by a pontoon platoon leader. Works with block and tackle equipment.

3. Four-man team headed by an NCO. Tows the pontoon sections to the bank.

4. Four-man team headed by an NCO. Disconnects the pontoon sections.

5. Team of four sections headed by the pontoon park platoon leader. Collects the pontoon sections and loads them onto the vehicles.

(Continuation of Figure 6)